

## CLAIMS

1. A process for preparing bleached sulfite chemical pulp, comprising the following steps:

delignifying chips of a lignocellulosic material in a sulfite pulping process until a defibration point of said lignocellulosic material is reached, and a fibrous material is obtained; and

bleaching the fibrous material with a bleaching sequence which is performed exclusively with chlorine-free reagents and comprises at least a first bleaching step with a chlorine-free oxidant in the presence of a base.

2. The process according to claim 1, wherein the fibrous material has a kappa value ranging between 50 and 75.
3. The process according to claim 1, wherein the sulfite pulping is conducted under acidic conditions.
4. The process according to claim 1, wherein the sulfite pulping is conducted in the presence of magnesium in an acidic environment.
5. The process according to claim 1, wherein the sulfite pulping is conducted with an aqueous solution containing magnesium bisulfite, optionally an excess of  $\text{SO}_2$ , at a temperature of  $130^\circ$  to  $165^\circ$  C and at a pH of 1.5 to 4.
6. The process according to claim 1, wherein the oxidant is hydrogen peroxide.
7. The process according to claim 1, wherein the reaction sequence for chlorine-free bleaching of pulp comprises at least one additional bleaching step with a chlorine-free oxidant in the presence of a base.
8. The process according to claim 7, wherein the oxidant used in the additional bleaching step is hydrogen peroxide or peracetic acid.

9. The process according to claim 1, wherein prior to treatment with an oxidant, treatment with a metal ion complexing agent is conducted.
10. The process according to claim 1, wherein the reaction sequence for chlorine-free bleaching of pulp comprises a final bleaching step with a reducing bleaching agent.
11. The process according to claim 10, wherein the reducing bleaching agent is selected from the group consisting of a water-soluble dithionite salt, hydroxylamine, thio urea, thioglycolic acid, borohydride hydride, and formamidinosulfinic acid.
12. A chemical pulp, obtainable by a sulfite pulping process and subsequent chlorine-free bleaching, wherein said chemical pulp has a degree of brightness of at least 83% ISO and a test sheet produced from said chemical pulp without beating has a strength, expressed as breaking length (measured according to Zellcheming V/12/57), of at least 6 km.
13. The chemical pulp according to claim 12, wherein said chemical pulp has a kappa number of between 10 and 30.
14. The chemical pulp according to claim 12, wherein said chemical pulp is subjected to a beating step following bleaching.
15. A paper or nonwoven prepared from a chemical pulp according to claim 12.
16. A paper according to claim 15 which is tissue paper.
17. A product prepared from nonwoven or paper according to claim 15.
18. The process according to claim 6, wherein the reaction sequence for chlorine-free bleaching of pulp comprises at least one additional bleaching step with a chlorine-free oxidant in the presence of a base.

19. The process according to claim 18, wherein the oxidant used in the additional bleaching step is hydrogen peroxide or peracetic acid.
20. The process according to claim 6, wherein prior to treatment with an oxidant, treatment with a metal ion complexing agent is conducted.
21. The process according to claim 6, wherein the reaction sequence for chlorine-free bleaching of pulp comprises a final bleaching step with a reducing bleaching agent.
22. The process according to claim 10, wherein the reducing bleaching agent is selected from the group consisting of a water-soluble dithionite salt, hydroxylamine, thio urea, thioglycolic acid, borohydride hydride, and formamidinosulfinic acid.